Louisville's Solid Waste Study Efforts

Future is Now

Our journey completing our first fully integrated solid waste management system study.

Basic Louisville Facts

Population: 741,096

Households: 305,000

Square Miles: 398 square miles

Landfill Space: Permitted 44 years

Tipping Gate Rate: $40 Ton

Diversion Rates:

- Curbside Residential: 13.8% (includes yard waste)
- Residential Commercial: 27.4%
- Overall Rate: 52.8%

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Fun Facts About Louisville

Kentucky Derby (horse racing)

Louisville Slugger Baseball Bats

Kentucky Fried Chicken

Bourbon-Bourbon and more Bourbon

Famous people: Muhammad Ali, Jennifer Lawrence, Diane Sawyer, and Tom Cruise

Mayor Greg Fischer was named among the most interesting mayor's in America.

Home to the largest building in the state but it is a former limestone mine called the "Mega Cavern"

Not So Fun Facts About Louisville

Has a very complex waste collection system

- Municipally provided-Urban Services District-40% of county
- Contractually provided-83 Incorporated Cities-18% of county
- Open Market-Unincorporated Area-42% of county

Has a merged government with…

- Twenty Six (26) seat Metro Council
- 82 incorporated cities which has 82 Mayors and Councils
- A Seven (7) member Waste Management District Board

Solid Waste Management in Louisville Metro is very complicated!

Why Conduct a Study?

To ensure Louisville Metro has planned for future disposal needs and we have an efficient and cost effective system that meets the needs of the community.

In House or Consultant Lead Study?

Questions?

- Do we have internal resources or experience?
- Would stakeholders trust an internal study?

The answer was “NO” because we needed to ensure impartial findings so any recommendation would have a base of support.

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Contractors Awarded to Bid

- MSW Consultants

  11875 High Tech Avenue, Orlando, Florida

- Cascadia Consulting Group

  1109 First Avenue, Seattle, Washington

- Abbe & Associates

  1028 Fair Oaks Avenue, Alameda, California

Study Scope


Waste Composition Study
Collection System Evaluation
Study Recommendations

Waste Composition Study

- **What is going into the landfill(s)?**
  - How many recyclables remain in the waste and what can potentially be targeted for recovery
- **How effective are our current recycling efforts?**
- **How much construction & demolition debris is being landfilled?**

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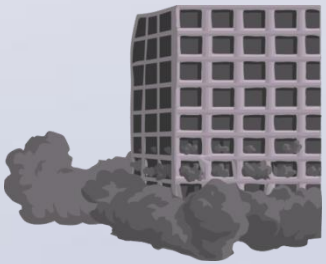
Waste Composition Study By Sector

- How much and what types of waste are being generated?
- Any decision to divert a particular waste may require different strategies based on that sector's unique nature.

Residential



Construction and Demolition

Industrial
Commercial
Institutional

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Sampling

When did we sample?

- Two season (winter and spring)

How detailed did we get?

- Comprehensive

Where did we sample?

- Landfill, transfer stations, and recycler

Composition Results

Aggregate MSW

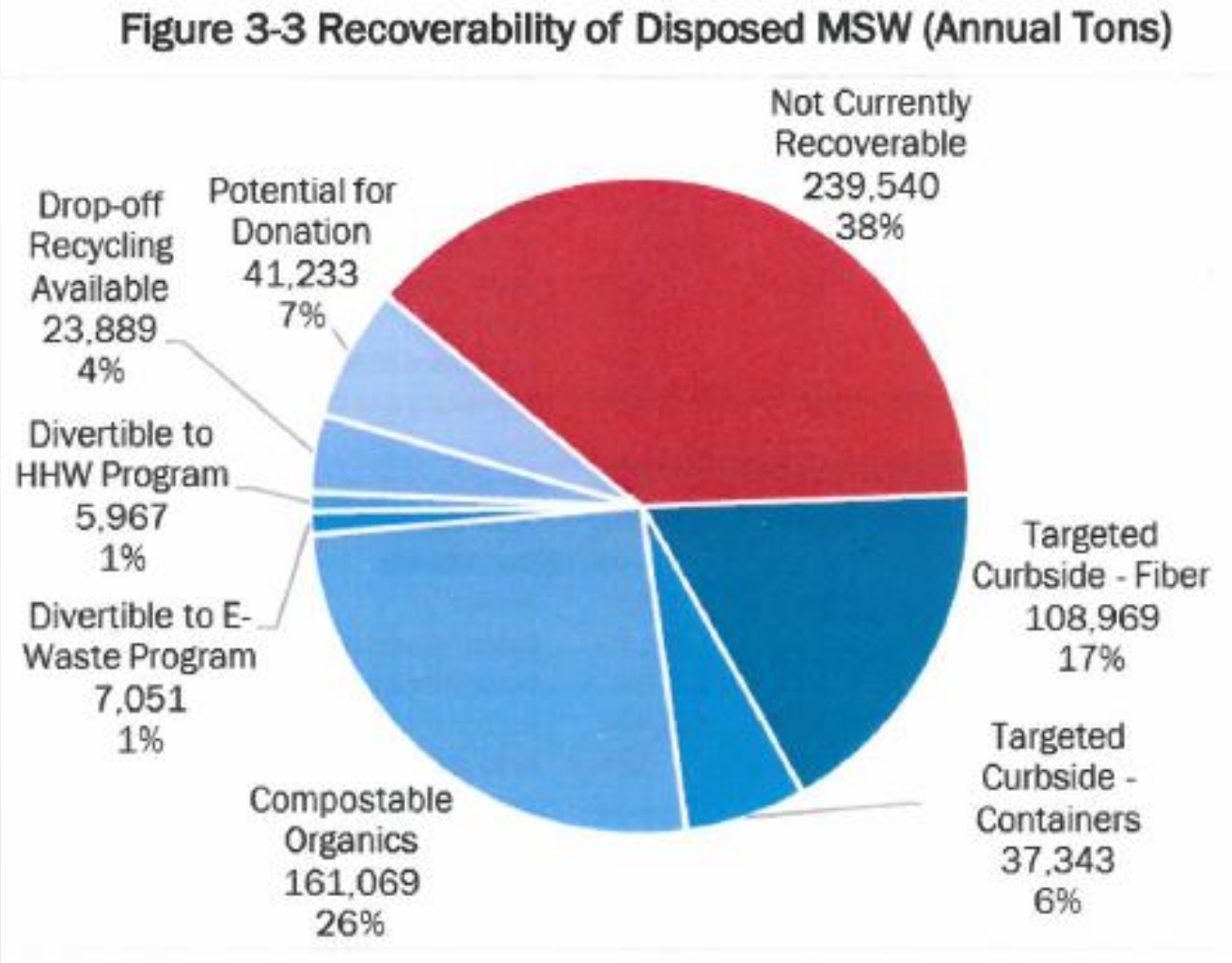
- Single Family
- Multi-Family
- Industrial-Commercial-Institutional
- Central Business District
- Single Stream Recycling

Aggregate C&D/Bulky/Self Hauled

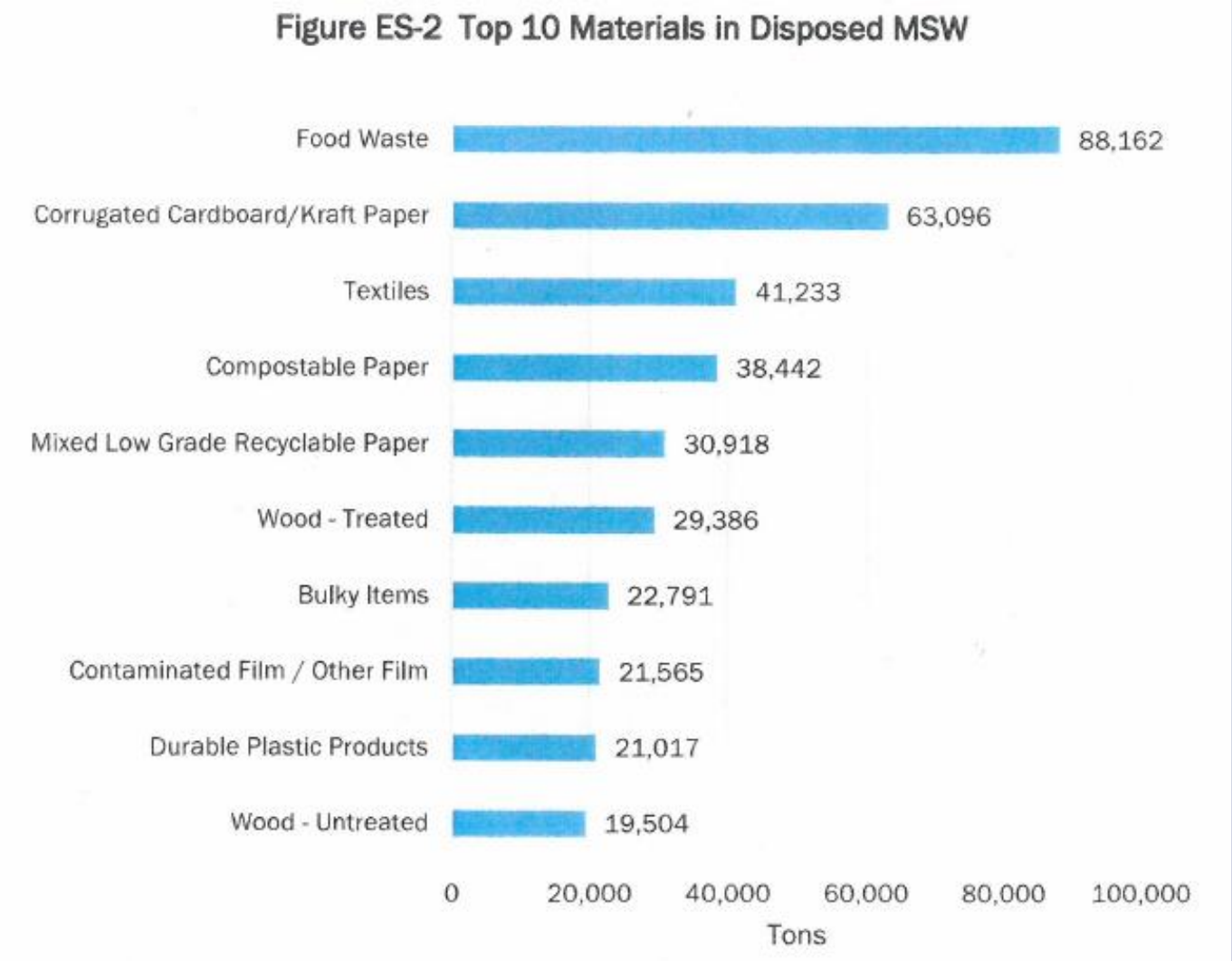
- Construction & Demolition
- Residential Bulky
- Self-hauled
- Non-C&D Bulky

Material Category	Average	Conf. Int (+/-)	Tons	Material Category	Average	Conf. Int (+/-)	Tons
Paper	**26.1%**	**2.6%**	**163,421**	**C&D Materials**	**14.0%**	**3.1%**	**87,696**
Corrugated Cardboard/Kraft Paper	10.1%	1.8%	63,096	Wood - Treated	4.7%	1.8%	29,386
High Grade Office Paper	0.8%	0.3%	5,070	Wood - Untreated	3.1%	1.2%	19,504
Newsprint	1.5%	0.5%	9,125	Remainder/Composite Wood	0.2%	0.1%	1,076
Mixed Low Grade Recyclable Paper	4.9%	1.0%	30,918	Asphalt, Brick, Concrete & Rocks	0.1%	0.1%	871
Aseptic Boxes & Gable Top Cartons	0.1%	0.0%	760	Asphalt Roofing	0.4%	0.6%	2,698
Compostable Paper	6.2%	0.9%	38,442	Ceramics	0.6%	0.8%	3,817
Remainder Composite Paper	2.6%	1.0%	16,010	Carpet & Carpet Padding	2.1%	0.9%	12,911
Plastic	**14.0%**	**2.5%**	**87,203**	Fiberglass Insulation	0.0%	0.0%	28
PET (#1) Bottles/Jars	1.3%	0.2%	7,891	Drywall /Gypsum Board	0.9%	0.6%	5,438
PET (#1) Non Bottle Containers	0.2%	0.1%	1,130	Remainder/Composite C&D	1.9%	1.1%	11,967
HDPE (#2) Bottles - Colored/Natural	0.5%	0.1%	3,429	**Household Hazardous Waste**	**1.0%**	**1.0%**	**5,967**
HDPE (#2) Non-Bottle Containers	0.0%	0.0%	279	Paint	0.1%	0.1%	386
Plastic Containers #3 thru #7	0.5%	0.1%	3,297	Paint Thinner/Chemical Cleaners		*Not found*	
Expanded Polystyrene "Styrofoam"	0.7%	0.2%	4,150	Fluorescent Bulbs & Ballasts	0.0%	0.0%	9
Durable Plastic Products	3.4%	2.0%	21,017	Batteries - Lead Acid	0.0%	0.0%	9
Clean Film (Non-Bag)	1.4%	1.2%	8,907	Batteries - All Other	0.0%	0.0%	248
Clean Shopping / Dry Cleaner Bags	0.1%	0.0%	897	Vehicle and equipment Fluids/Fuels	0.0%	0.0%	2
Contaminated Film / Other Film	3.5%	0.4%	21,565	Pesticides/Herbicides & Fertilizers		*Not found*	
Remainder/Composite Plastic	2.3%	1.0%	14,643	Empty HHW Containers	0.0%	0.0%	81
Metal	**3.5%**	**1.0%**	**22,151**	Medical Waste & Sharps	0.8%	1.0%	4,910
Aluminum Cans & Containers	0.3%	0.0%	2,089	Other Hazardous Waste / Other HHW	0.1%	0.0%	322
Aluminum Plates & Foils	0.1%	0.0%	632	**Electronics**	**1.1%**	**0.6%**	**7,051**
Tin/Steel Containers	0.7%	0.2%	4,568	Computers & Related Elec. Products	0.3%	0.2%	1,804
Empty Paint & Aerosol Cans	0.1%	0.0%	535	Televisions and CRT/LCD Monitors	0.3%	0.4%	2,173
Empty Compressed Fuel Containers	0.0%	0.1%	240	Small Consumer Electronics	0.3%	0.2%	2,151
Other Ferrous	0.3%	0.2%	1,701	Other Larger Electronics	0.1%	0.2%	923
Other Non-Ferrous	0.1%	0.1%	340	**Other Wastes**	**15.5%**	**2.5%**	**97,142**
Major Appliances	0.3%	0.4%	1,934	Textiles	6.6%	1.7%	41,233
Remainder/Composite Metal	1.6%	0.9%	10,110	Rubber Products	0.5%	0.3%	3,388
Glass	**2.5%**	**0.9%**	**15,739**	Disposable Diapers/Sanitary Products	1.8%	0.4%	10,969
Glass Bottles & Jars	2.2%	0.8%	13,493	Bottom Fines & Dirt	2.0%	0.6%	12,803
Flat Glass	0.0%	0.0%	134	Bulky Items	3.6%	1.9%	22,791
Remainder/Composite Glass	0.3%	0.2%	2,112	Tires	0.8%	0.7%	4,787
Organics	**22.2%**	**2.6%**	**138,691**	Other Miscellaneous	0.2%	0.1%	1,170
Food Waste	14.1%	2.4%	88,162	Restaurant Fats, Oils, and Grease		*Not found*	
Leaves and Grass	2.6%	1.1%	16,258				
Prunings & Trimmings	1.3%	0.9%	8,141				
Branches & Stumps	1.6%	1.2%	10,066				
Animal By-Products & Manures	1.2%	0.7%	7,484	**Grand Total**	**100%**		**625,061**
Remainder/Composite Organic	1.4%	0.9%	8,579	***No of Samples***	**99**		

Composition Results



Composition Results



Waste Collection System Study

To understand the over all system of services levels and cost on a household basis

Important for us to understand…

- Service Levels
- Participation rates
- Efficiency/cost
- Processing capabilities
- Operational details of municipal system (DPW)
- All based upon system area/type

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Areas Studied

- Municipal System-DPW (organized)
  - Information is easy to obtain
    - Common good services
    - Budget system issues
- Incorporated Cities-Contracted (organized)
  - More difficult to obtain
  - Precise information
    - Contracts spell out services and cost
- Unincorporated areas-Open Market (unorganized)
  - Most difficult information to obtain
  - Most difficult to determine services

Pre-Study Preparations

Be prepared to obtain and explain the entire collection system

- Ordinance/Regulations
- Service levels
- Governance structure
- Potential stakeholder concerns

Pre-Study Preparations

Identify **key people early and impress upon them the need to be detailed and to dedicate time.**

- Route managers/supervisors
- Fleet manager
- GIS manager
- Business office
- Administrative Manager
- The key person(s) with overall system information

Study Team Information Request

Be prepared to explain your budget system and operations (municipal-DPW)

- List all services provided and understand how they relate to cost centers
- Assigning personnel to individual cost centers (services)
- Assigning equipment to individual cost centers (services)
- Maintenance cost (Fleet)
- Customer base (who you service)

Study Team Information Request

Gathering information from non-municipal entities

- Incorporated cities (contracted services)
  - Ask for service contracts
  - Freedom of Information Act Request
- Unincorporated areas (open market)
  - Individual meetings with private waste haulers to gauge willingness to participate and share information
  - If information is not forthcoming be ready to conduct statistically significant surveys

Study Reports

- Overview of Entire System
  - Services and demographics
  - Governance and regulations
  - Disposal and processing facilities
- Operational details of municipal services
  - Residential productivity metrics
  - Collection system staffing analysis
  - Fleet inventory to include spare vehicle rates
  - Analysis of vehicle age
  - Technology assessment
  - Opportunities
- Benchmarking
- Cost of services for each sector
- Opportunities/Conclusions

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Sample DPW Productivity Metrics

Table 2-3 Residential Productivity Metrics

Collection Service		Residential Units Served	Other Customers	Annual Tons Collected	Current Routes per Day	Estimated Set-out Rate	Seconds per Unit	Lbs per Unit
Refuse Collection	Curbside Automated	30,168	610	24,249	7	76%	22.0	39.9
	Alley Semi-auto	56,026	1,134	45,034	14	77%	13.2	39.4
Single Stream Recycling		86,194	900	11,394	7	45%	15.1	11.2
Yard Waste		86,194		10,511	7	25%	20.6	18.8
Bulk Waste	Bobcat/rearload	60,336		13,578	2	18%	175.0	625.1
	Grapple	25,858		5,819	3	20%	540.0	562.6
Total		86,194	2,644	110,585	40			

DPW Staffing Analysis

Table 2-4 Collection System Staffing Analysis

Function	FTEs	Routes	Available Staff per Route	Crew Size	Active Crew Demand
Residential Refuse Collection – Rearload	67.0	14	4.8	3	42
Residential Refuse Collection – Automated	8.8	7	1.3	1	7
Residential Recycle Collection and Processing	29.0	7	4.1	3	21
Residential YW Collection	34.2	7	4.9	3	21
Residential Bulk Waste Collection	35.1	5	7.0	*	13
CBD Wet/Dry Collection and Processing	10.6	2	5.3	3	6
Street Sweeping	11.2	7	1.6	1	7
Dead Animal Collection	2.0	1	2.0	1	1
Total	**197.9**	**50.0**	**4.0**		**118**

* Grapple truck teams have 2-person crews, rearloaders with bobcats have 3-person crews.

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DPW Vehicle Inventory and Fleet Age

Table 2-6 Analysis of Fleet Vehicle Age

Equipment Type	Number of Pieces	Useful Life (Years)	Expected Average Age (Years)	Actual Average Age (Years)	Status
Automated Sideloader	16	7	3.5	2.4	ok
Rearloader	66	10	5	11.9	severely deficient
Grapple Truck	4	7	3.5	5.5	deficient
Roll-off Truck	3	10	5	5.3	deficient
Street Sweeper	8	7	3.5	6.4	severely deficient
Medium Duty Truck	7	10	5	10.9	severely deficient
Mobile Equipment	7	10	5	7.7	deficient
Pick-up Truck	23	10	5	11.0	severely deficient
Sedan	11	10	5	10.5	severely deficient
Trailer	4	15	7.5	4.0	ok
Container	21	10	5	7.0	deficient
Total	**170**			**9.3**	

DPW Cost of Services by Function

Function	Allocated Full Cost	Allocated FTEs	Allocated Vehicles	Routes
Residential Refuse Collection - Rearload	$6,670,553	67.0	22.1	14
Residential Refuse Collection - Automated	$2,117,833	8.8	9.7	7
Residential Recycle Collection and Processing	$2,835,639	29.0	14.5	7
Residential YW Collection	$2,991,669	34.2	14.3	7
Residential Bulk Waste Collection	$3,500,425	35.1	33.8	5
CBD Services (Wet/Dry, Litter, Sweeping)	$1,089,430	10.6	1.5	3
Waste Reduction Center Operations	$1,668,124	9.3	1.8	
Unstaffed Drop-off (PW) Operations	$632,618	4.0	31.0	
Staffed Drop-off (WMD) Operations	$322,218	5.8	0.0	
Snow/ Ice Removal	$280,053	0.0	9.7	
HHW	$269,965	0.0	1.2	
Litter Removal	$134,013	2.0	0.8	
Enforcement/Illegal Dumping	$510,890	7.0	2.6	
Government Building Collection Contract	$212,361	0	0.0	
Street Sweeping	$1,319,795	11.2	14.9	7
Dead Animal Collection	$156,948	2.0	1.0	1
WMD Mgmt & Admin	-$516,116	4.0	11.4	
SWMS Mgmt & Admin	$918,851	10.0	0.0	
Total	**$25,115,269**	**240**	**170**	**51**

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Cost of Services Study Results

Garbage Collection

Department of Public Works	
Automatic	$5.58
Semi-automatic	$9.48
Contracted Incorporated	$6.00-$14.72
Open Market Unincorporated Area	$17.38 Average

Recycling Collection

Department of Public Works	$2.74 (week)
Contracted Incorporated	$3.92 (week) or $1.60 (EOW)
Open Market Unincorporated Area	$17.38 Average

Cost of Services Study Results

Yard Waste Collection

Department of Public Works	$2.89 (week-year round)
Contracted Incorporated	$3.24 (week-mostly seasonal)
Open Market Unincorporated Area	$8.67 (Average-week-mostly seasonal)

Bulky Item Collection

Department of Public Works	$3.78 (3 times per year, unlimited items)
Contracted Incorporated	$0 (varied from not included to 1 item (week or month))
Open Market Unincorporated Area	$0 (varied from not included to 1 item (week or month))

All Inclusive Collection

Department of Public Works	$14.59 to 18.50
Contracted Incorporated	$12.20 to14.70
Open Market Unincorporated Area	$32.05 (Average)

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Developing Study Recommendations

Study team lead community stakeholders through a process of information and decision making to arrive at recommendations to move our community forward.

Stakeholder Process

Three stakeholder meetings:

- Developed guiding principles to be used in the planning process.
- Presented waste composition and collection system study.
- Presented *potential* new or expanded policies, programs, strategies.
- Conducted a voting method for stakeholders to identify high, med, low priorities.

Unscheduled fourth stakeholder meeting:

- Panel discussion in which speakers from different sectors were able to voice their concerns and be asked questions. This was to ensure the study team heard all sides.

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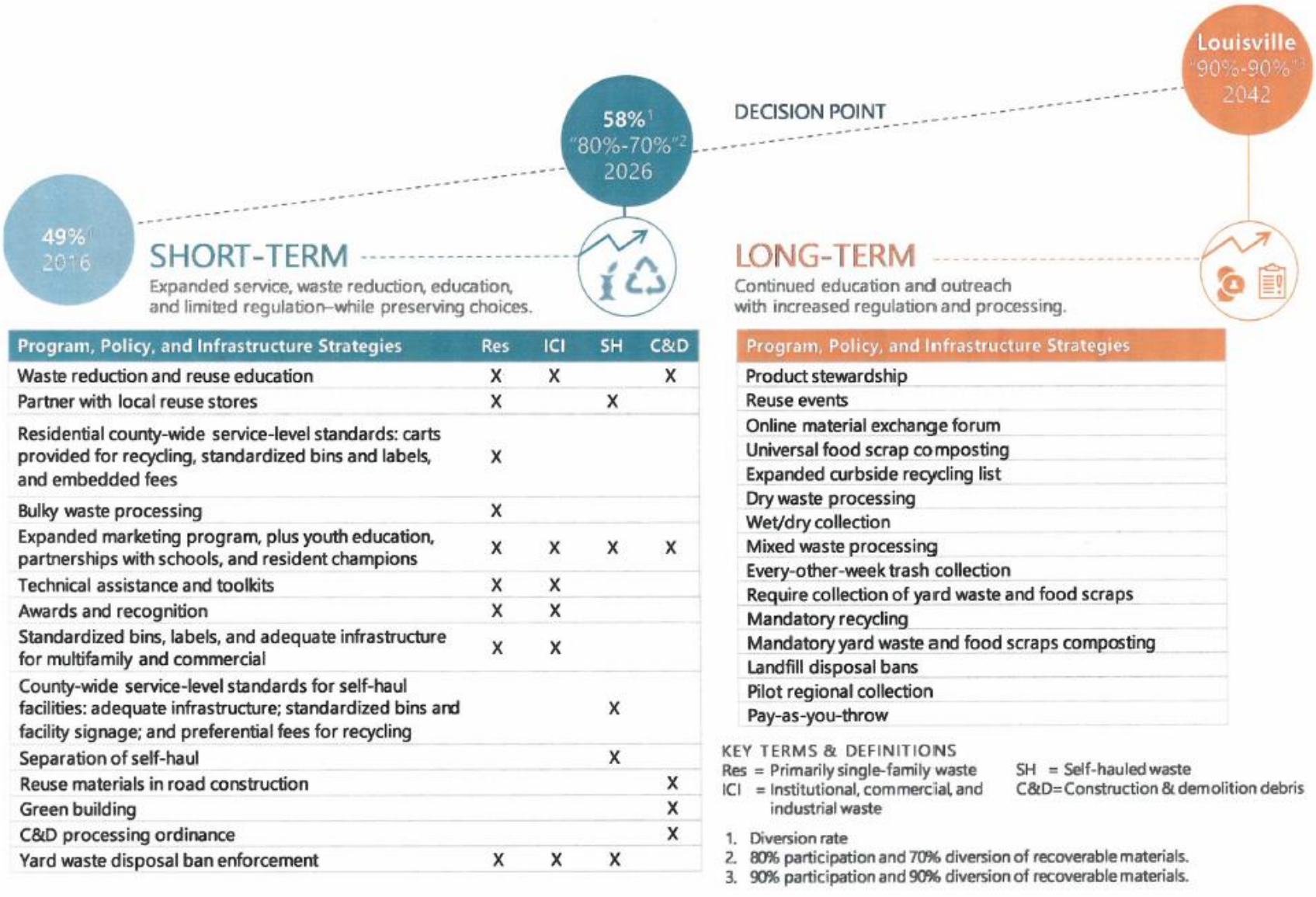
Recommendations



Program, Policy, and Infrastructure Strategies	Res	ICI	SH	C&D
Waste reduction and reuse education	X	X		X
Partner with local reuse stores	X		X	
Residential county-wide service-level standards: carts provided for recycling, standardized bins and labels, and embedded fees	X			
Bulky waste processing	X			
Expanded marketing program, plus youth education, partnerships with schools, and resident champions	X	X	X	X
Technical assistance and toolkits	X	X		
Awards and recognition	X	X		
Standardized bins, labels, and adequate infrastructure for multifamily and commercial	X	X		
County-wide service-level standards for self-haul facilities: adequate infrastructure; standardized bins and facility signage; and preferential fees for recycling			X	
Separation of self-haul			X	
Reuse materials in road construction				X
Green building				X
C&D processing ordinance				X
Yard waste disposal ban enforcement	X	X	X	

Program, Policy, and Infrastructure Strategies
Product stewardship
Reuse events
Online material exchange forum
Universal food scrap composting
Expanded curbside recycling list
Dry waste processing
Wet/dry collection
Mixed waste processing
Every-other-week trash collection
Require collection of yard waste and food scraps
Mandatory recycling
Mandatory yard waste and food scraps composting
Landfill disposal bans
Pilot regional collection
Pay-as-you-throw

KEY TERMS & DEFINITIONS

Res = Primarily single-family waste
ICI = Institutional, commercial, and industrial waste
SH = Self-hauled waste
C&D = Construction & demolition debris

1. Diversion rate
2. 80% participation and 70% diversion of recoverable materials.
3. 90% participation and 90% diversion of recoverable materials.

Recommendations

Recommends new Louisville Metro Goal

- Short Term: 80% participation and 70% diversion of recoverable materials
- Long Term: 90% participation and 90% diversion of recoverable materials

Key Learnings!

Key Learnings-Before Study

Stakeholder involvement from the earliest possible moment is crucial

- Identify key stakeholders and engage them early.
- Build trust
- Understand stakeholder concerns/fears.

Key Learnings-During Study

Transparency is important for trust and to show you have done your due diligence

- Consider a file sharing system for documents so everyone can get to them.
- Keep close contact with stakeholders and keep them informed.
- Facts are Facts even if it makes you look bad
- Don’t give in to special interest
- Stay the course

Key Learnings-During Study

Document-Document-Document

- Documenting meetings, emails, and conversations
- Important for reducing confusion and keeping everyone on the same page

Future is Now!

Study is complete and public

- Presentations to governing bodies and community on study contents and getting feedback is in progress

Building Support

- Building grass root support for select recommendations
- Setting the table for approval to move forward

Timing

- Gaining approval for recommendations
  - Hiring additional education or enforcement staff
  - Adopting regulation or ordinance

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Find Our Study

Solid Waste Study Report January 2018 | LouisvilleKy.gov

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Q&A

Questions?